

[0040] The device 700 may further comprise a camera module 736 for capturing static and/or dynamic images. The device 700 further comprises a battery 734, such as a vibrating battery set, for supplying power to various circuits required for operating the mobile terminal 700 and alternatively providing mechanical vibration as detectable output. The device 700 may further comprise a user identification module (UIM) 738. The UIM 738 is usually a memory device with a processor built in. The UIM 738 may for example comprise a subscriber identification module (SIM), a universal integrated circuit card (UICC), a universal user identification module (USIM), or a removable user identification module (R-UIM), etc. The UIM 738 may comprise a card connection detecting apparatus according to embodiments of the present invention.

[0041] The device 700 further comprises a memory. For example, the device 700 may comprise a volatile memory 740, for example, comprising a volatile random access memory (RAM) in a cache area for temporarily storing data. The device 700 may further comprise other non-volatile memory 742 which may be embedded and/or movable. The non-volatile memory 742 may additionally or alternatively include for example, EEPROM and flash memory, etc. The memory may store any item in the plurality of information segments and data used by the device 700 so as to implement the functions of the device 700.

[0042] The several exemplary embodiments of the present invention have been described above just for the purpose of illustration. It should be understood that the present invention is not limited to the disclosed embodiments. On the contrary, the present invention intends to cover various modifications and equivalent arrangements included in the spirit and scope of the appended claims. The scope of the appended claims meets the broadest explanations and covers all such modifications and equivalent structures and functions.

1. A capacitive touch sensor circuit for a touch screen comprising:

a plurality of driving elements arranged as multiple rows in parallel with a horizontal axis of the touch screen, wherein the plurality of driving elements are connected into a plurality of driving lines; and

a plurality of sensing elements arranged as multiple columns in parallel with a vertical axis of the touch screen, wherein the plurality of sensing elements are connected into a plurality of sensing lines, each of the plurality of sensing elements being paired with a respective one of the plurality of driving elements,

wherein the driving lines and the sensing lines are configured as at least one of: at least two driving elements of one of the plurality of driving lines being positioned at different rows; and

at least two sensing elements of one of the plurality of sensing lines being positioned at different columns.

2. The capacitive touch sensor circuit of claim 1, wherein at least one of the driving lines is linear.

3. The capacitive touch sensor circuit of claim 1, wherein at least one of the sensing lines is linear.

4. The capacitive touch sensor circuit of claim 1, wherein the driving lines are configured so that, with respect to a touch area, each of driving elements positioned in a row within the touch area belongs to a different driving line.

5. The capacitive touch sensor circuit of claim 1, wherein the sensing lines are configured so that, with respect to a touch area, each of sensing elements positioned in a column within the touch area belongs to a different sensing line.

6. The capacitive touch sensor circuit of claim 1, wherein each of the plurality of driving elements belongs to an exact one driving line, and each of the plurality of sensing elements belongs to an exact one sensing line.

7. A method of forming a capacitive touch sensor circuit for a touch screen comprising:

forming a plurality of driving elements as multiple rows in parallel with a horizontal axis of the touch screen;

forming a plurality of sensing elements as multiple columns in parallel with a vertical axis of the touch screen; and

forming a plurality of driving lines and a plurality of sensing lines, wherein the plurality of driving elements are connected into a plurality of driving lines, and wherein the plurality of sensing elements are connected into a plurality of sensing lines,

wherein the driving lines and the sensing lines are configured as at least one of: at least two driving elements of one of the plurality of driving lines being positioned at different rows; and

at least two sensing elements of one of the plurality of sensing lines being positioned at different columns.

8. The method of claim 7, wherein at least one of the driving lines is linear.

9. The method of claim 7, wherein at least one of the sensing lines is linear.

10. The method of claim 7, further comprising configuring the driving lines so that, with respect to a touch area, each of driving elements positioned in a row within the touch area belongs to a different driving line.

11. The method of claim 7, further comprising configuring the sensing lines so that, with respect to a touch area, each of sensing elements positioned in a column within the touch area belongs to a different sensing line.

12. The method of any of claim 7, wherein each of the plurality of driving elements belongs to an exact one driving line, and each of the plurality of sensing elements belongs to an exact one sensing line.

13. A touch screen comprising a capacitive touch sensor circuit according to claim 1.

14. A mobile device comprising a capacitive touch sensor circuit according to claim 1.

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